

## Effect of irradiation by argon ions on hydrogen transport through the surface oxide layer of zirconium

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### Abstract

Effect of zirconium irradiation by 1 keV Ar<sup>+</sup> ions on hydrogen transport through the surface oxide layer is studied. It is shown that deuterium trapping under subsequent irradiation of the Ar-treated sample by deuterium atoms of thermal energies in D<sub>2</sub> + 30at.% O<sub>2</sub> gas mixture is 2 times less than trapping in the untreated sample. Besides, irradiation of the untreated sample by D-atoms provokes desorption of  $\approx 25\%$  of hydrogen contained therein, whereas hydrogen desorption from the ion-treated zirconium surface does not occur. It is proposed that oxygen depletion of the surface oxide layer, caused by ion bombardment, is a reason of mitigation of the hydrogen transport through this layer in both directions.

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